WHAT IS CLAIMED IS:

1. A method to decrease emission of mercury, comprising:

selecting a factor from to control a combustion process to generate a flue gas comprising fly ash with enhanced unburned carbon;

controlling the combustion process according to a factor selected from reburning fuel, flue gas temperature, OFA injection, coal particle size, LNB flow, LNB design, combustion zone air, stoichiometric ratio of fuel, fuel/air mixing in a primary combustion zone and fuel/air mixing in a secondary combustion zone to produce the flue gas comprising fly ash with enhanced unburned carbon and to vaporize mercury; and

allowing the flue gas to cool to collect fly ash with enhanced unburned carbon with absorbed mercury.

2. The method of claim 1, comprising controlling the combustion process to produce a fly ash containing about 1 to about 30 weight percent carbon.

3. The method of claim 1, comprising controlling the combustion process to produce a fly ash containing 3 to 20 weight percent carbon.

4. The method of claim 1, controlling the combustion process to produce a fly ash containing 5 to 15 weight percent carbon.

5. The method of claim 1, comprising allowing the flue gas to cool to a temperature below 450° F.

6. The method of claim 1, comprising allowing the flue gas to cool to a temperature below 400° F.

7. The method of claim 1, comprising allowing the flue gas to cool to a temperature below 350° F.

8. The method of claim 1, wherein the process to remove NO_x from the flue gas comprises forming fuel-lean and fuel-rich zones by a fuel staging process or an air staging process.

9. The method of claim 1, further comprising removing NO_x from the flue gas.

10. The method of claim 1, further comprising removing NO_x from the flue gas by a low NO_x combustion technology.

11. The method of claim 1, further comprising removing NO_x from the flue gas by a technology selected from low NO_x burning, reburning, air staging, fuel-lean reburning and overfire air injection.

12. The method of claim 1, further comprising removing NO_x from the flue gas by forming a fuel-lean zone and a fuel-rich zone by injection of solid fuel into a post combustion zone.

13. The method of claim 1, wherein the flue gas is generated from combustion of solid fuel.

14. The method of claim 1, wherein the flue gas is generated from combustion of a solid fuel selected from coal, biomass, waste product and combinations thereof.

15. The method of claim 1, comprising selecting a factor from the group consisting of amount of reburning fuel, flue gas temperature and OFA injection.

16. The method of claim 1, comprising selecting a factor from the group consisting of coal type and particle size.

17. The method of claim 1, comprising selecting a factor from the group consisting of LNB flow, LNB design, combustion zone air, stoichiometric ratio of fuel, fuel/air mixing in a primary combustion zone or fuel/air mixing in a secondary combustion zone.

18. A method to decrease emissions of nitrogen oxide and mercury while decreasing carbon in fly ash, comprising:

selecting a combination of factors from the group consisting of fuel type, fuel staging, air staging and a combustion condition to control a combustion process to generate a flue gas comprising fly ash with enhanced unburned carbon;

controlling the combustion process according to the factors to produce the flue gas comprising fly ash with enhanced unburned carbon, NO_x and vaporized mercury;

removing NO_x from the flue gas;

allowing the flue gas to cool to a lower temperature to collect fly ash with absorbed mercury;

passing the fly ash with absorbed mercury through an ash burnout unit to remove carbon from the fly ash and to produce a mercury-containing exhaust gas; and

passing the mercury-containing exhaust gas through a collection unit to capture the mercury.

19. A system to decrease emission of mercury; comprising:

a combustion zone that is controlled to generate a flue gas comprising fly ash with enhanced unburned carbon and that produces vaporized mercury; and

a post combustion zone to cool the flue gas to collect fly ash with enhanced unburned carbon with absorbed mercury.

20. A system to decrease emissions of nitrogen oxide and mercury while decreasing carbon in fly ash, comprising:

a combustion zone that is controlled by fuel type, fuel staging, air staging or a combustion condition to generate a flue gas comprising fly ash with enhanced unburned carbon and that produces vaporized mercury;

a post combustion zone to cool the flue gas to collect fly ash with enhanced unburned carbon with absorbed mercury;

an ash treatment unit that removes carbon from the fly ash and produces a mercury-containing exhaust gas; and

a collection unit that captures the mercury.

21. The system of claim 20, additionally comprising a particulate collector to collect fly ash with enhanced unburned carbon with absorbed mercury.

22. The system of claim 21 wherein the particulate control device is selected from a dry electrostatic precipitator, wet electrostatic precipitator, baghouse and fabric filter.

23. The system of claim 20, wherein the ash treatment unit is a reactor in which carbon is burned out from ash in the presence of air to generate carbon dioxide or is an electrostatic separator.

24. The system of claim 20, wherein the collection unit is selected from the group consisting of an activated carbon collection system, mercury adsorption system, mercury oxidation system, reactor for forming amalgam, reactor for wet capture of mercury, scrubber, catalytic oxidation system, zeolite-based mercury system and combinations of thereof.

25. The system of claim 20, wherein the ash treatment unit is a burnout unit and If a burnout heat is recovered from the unit by preheating water used for boiler heat exchange.